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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/884,451	06/19/2001	Robert Dolan	101361-0043	1957

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EXAMINER

MALDONADO, JULIO J

ART UNIT PAPER NUMBER

2823

DATE MAILED: 10/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/884,451

Applicant(s)

DOLAN ET AL.

Examiner

Julio J. Maldonado

Art Unit

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 July 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,6-13 and 20-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 10-13 is/are allowed.
- 6) ☒ Claim(s) 1,6-9 and 20-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

1. Applicant's cancellation of claims 2-5 and 14-19 is acknowledged. Claims 20-25 are newly added. Thus, claims 1, 6-13 and 20-25 are pending in this application.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 6-9 and 20-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakaguchi et al. (U.S. 6,313,014) in view of Ogura et al. (U.S. 6,506,662 B2).

In reference to claims 1 and 20-25, Sakaguchi et al. (Fig.1-5) in a related method to form buried oxide films teach placing the substrate (23) into a vacuum chamber, the substrate being treated with a background fluid other than molecular oxygen, said fluid comprising hydrogen and said hydrogen is a surface inhibiting agent; evacuating the vacuum chamber to a first pressure; and implanting ions into the substrate (23) to form a buried oxide layer under a top silicon layer (22), where the fluid inhibits formations of threading dislocations in the top silicon layer (22) for reducing a defect density of the processed substrate; and selecting the fluid from fluids that inhibit formations of threading dislocations in the top silicon layer (22) for reducing a defect density of the processed substrate (23) (column 2, line 53 – column 16, line 25).

Sakaguchi et al. fail to teach introducing a fluid other than molecular oxygen in a vacuum chamber as a background fluid. However, Ogura et al. (Figs.1C-3) in a related method to form a buried oxide layer by ion irradiation teach introducing a fluid other than molecular oxygen as a background fluid in a vacuum chamber; and implanting oxygen atoms into a substrate (column 3, lines 60 – 65, column 4, lines 1 – 4, column 8, line 61 – column 9, line 2 and column 9, lines 54 – 62). Therefore, it would have been obvious to one of ordinary skill in the art to include a fluid other than pure molecular oxygen as taught by Ogura et al. in the buried oxide formation method, and furthermore since this would increase the manufacturing condition for the formation of said buried oxide (column 8, line 61 – column 9, line 2).

In reference to claims 6 and 7, Sakaguchi et al. in combination with Ogura et al. substantially teach all aspects of the invention but fail to teach the first pressure is less than about 1×10^{-5} Torr and a second pressure less than about 1×10^{-3} . However, the examiner takes official notice that the selection of the claimed ranges is obvious because it is a matter of determining optimum process condition by routine experimentation with a limited number of species.

In reference to claims 8 and 9, Sakaguchi et al. in combination with Ogura et al. teach controlling the amount of fluid introduced into the vacuum chamber based upon a parameter measured in the chamber, said parameter consisting from the group consisting of ion concentration and temperature (column 2, line 53 – column 16, line 25).

Allowable Subject Matter

4. Claims 10-13 are allowed.

The following is a statement of reasons for the indication of allowable subject matter: Sakaguchi et al. (Fig.1-5) in a related method to form buried oxide films teach placing the substrate (23) into a vacuum chamber, the substrate being treated with a fluid other than molecular oxygen, said fluid comprising hydrogen and said hydrogen is a surface inhibiting agent; evacuating the vacuum chamber to a first pressure; and implanting ions into the substrate (23) to form a buried oxide layer under a top silicon layer (22), where the fluid inhibits formations of threading dislocations in the top silicon layer (22) for reducing a defect density of the processed substrate; and selecting the fluid from fluids that inhibit formations of threading dislocations in the top silicon layer (22) for reducing a defect density of the processed substrate (23) (column 2, line 53 – column 16, line 25). However, Sakaguchi et al. neither teach nor suggest measuring a decrease in the ion beam current level due to the fluid in the chamber; and adjusting the fluid level based upon the measured ion beam current level.

5. Applicant's arguments filed 07/11/2003 have been fully considered but they are not persuasive.

Applicants argue, "...Ogura fails to teach or suggest utilizing a background gas while implanting ions in a substrate... Ogura relates to dissociation of molecules in the plasma chamber and not introduction of background gas in the reaction chamber...". In response to this argument, Ogura et al. teach that species other than molecular oxygen are present during the oxygen ion implantation, and these species are eliminated during

a further thermal process (Ogura et al., column 8, line 50 – column 9, line 2).

Furthermore, none of the claims recite, "utilizing a background gas while implanting ions in a substrate" as argued.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.


7. Papers related to this application may be submitted directly to Art Unit 2823 by facsimile transmission. Papers should be faxed to Art Unit 2823 via the Art Unit 2823 Fax Center located in Crystal Plaza 4, room 3C23. The faxing of such papers must conform to the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The Art Unit 2823 Fax Center number is **(703) 305-3432**. The Art Unit 2823 Fax Center is to be used only for papers related to Art Unit 2823 applications.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Julio J. Maldonado** at **(703) 306-0098** and between the

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hours of 8:00 AM to 4:00 PM (Eastern Standard Time) Monday through Friday or by e-mail via julio.maldonado@uspto.gov. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri, can be reached on (703) 306-2794.

Any inquiry of a general nature or relating to the status of this application should be directed to the **Group 2800 Receptionist** at **(703) 308-0956**.


JMR
9/22/03


George Fourson
Primary Examiner